

## **HOUSES HAVE CRACKS**

There are no perfect houses. Whether you have a new home or one that's a hundred years old, **houses have cracks**.

Houses shift and settle into position - even an old house that has long since settled moves a little now and then:

- After construction, houses settle into position.
- Concrete shrinks and cracks as it cures.
- Clay bricks expand as they absorb moisture.
- Structural components bend under the weight of furniture and people.
- Structural components expand and contract with varying humidity and temperature.
- Vibrations make their way through the structure of your house. A passing truck for example.

Houses will have cracks in either the cosmetic finishes or structural components. Most of these cracks have no structural significance.

Occasionally, a crack that develops indicates that something structurally significant is happening. Sometimes, a one-time visit cannot determine if a crack is structurally significant. You may have to monitor a crack over a period of time to make an accurate determination. Unfortunately, this is not compatible with most real estate transactions. Clients want to know immediately if a crack is likely to be the result of a major structural problem. Pillar To Post® home inspectors use every technique to help their clients.

## **SHRINKAGE CRACKS**

A newly poured, concrete foundation can contain small cracks because concrete shrinks as it cures. Fortunately, a shrinkage crack in a foundation wall is not structurally significant. Here's how to recognize a shrinkage crack in a poured, concrete foundation:

- The crack will be small, less than 1/8th of an inch wide.
- The crack will be vertical.
- The crack will not extend up through the structure. The crack is in the foundation wall only.
- Shrinkage cracks usually occur in the middle third of the length of the foundation wall. This is not unique to shrinkage cracks but we do know that if the crack is located towards the end of the length of the foundation wall, it's probably not a shrinkage crack.

The only significance of a shrinkage crack is the possibility of water infiltration. If water is seeping through, a contractor can inject the crack with a sealant.

## **HORIZONTAL CRACKS IN A BASEMENT FOUNDATION WALL**

This discussion relates to cracks in the concrete foundation wall for a house with a basement. This is not relevant to slabs on grade or to cracks in walls above grade level.

A horizontal crack in a foundation wall, below grade, which runs the length of the basement, is likely a sign that the foundation is failing under the weight of the surrounding soil. The soil outside the foundation wall exerts an enormous pressure on the foundation wall. Foundation walls are designed to be strong enough to resist this load. Occasionally, unanticipated additional loads exert pressure and the foundation begins to fail, resulting in a horizontal crack in the foundation wall.

## SETTLEMENT CRACKS

Foundation settlement cracks are vertical, extending up through the structure. The fact that settlement cracks extend up through the structure, helps us to distinguish them from shrinkage cracks. For a brick home, you may see cracks following the mortar joints in the brick wall.

In most cases, the settlement crack itself has no structural significance. It's the settlement we are concerned with, not the cracks. We are concerned that the house could continue to settle over time. The reality is, most settlement cracks are the result of short-term settlement. Ongoing settlement is unlikely and uncommon. Unfortunately, it is very difficult to identify ongoing settlement from a one-time visit to the home. To prove that ongoing settlement is not taking place, we would have to take measurements and come back again years later to verify that there has been no additional settlement. Since this is not compatible with a real estate transaction, we have to use our experience to 'read the cracks' and take an educated guess as to whether ongoing settlement is likely. Here are a few of the key indicators inspectors look for:

**Settlement crack size:** A larger settlement crack is more likely due to ongoing movement than a smaller settlement crack. While there are no hard and fast rules, a settlement crack or series of settlement cracks that have a sum total opening of less than 1/4 inch are probably not due to ongoing settlement. This assumes the house has been there for a few years. This is just a first guess. There is really no way to determine conclusively that there will be no further settlement of the home.

**Direction of movement:** A typical settlement crack is vertical. The bumps and crevices on adjacent crack faces line up and fit together like the pieces of a puzzle. If the crack face has moved in any other direction, such as a shear crack, the quarter-inch rule does not apply. This can be a significant structural concern.

**Repaired and re-cracked:** A settlement crack that has been repaired and has re-cracked (not just a hairline crack) also could indicate ongoing movement.

